

IN THE CLAIMS

Pursuant to 37 CFR §121(c), the claim listing, including the text of the claims, will serve to replace all prior versions of the claims, in the application.

Please amend claims 1, 2, 5, 7 and 9 thru 29 as follows:

1 1. (Currently Amended) An apparatus for controlling load balance of
2 multi-access points in a wireless local area network system, the apparatus comprising:

3 a plurality of wireless local area network terminals having wireless local area
4 network interfaces and receiving a wireless local area network service;

5 a plurality of access points for providing the wireless local area network service to
6 the wireless local area network terminals, for periodically transmitting load state
7 information, and for suppressing an increase of load when a load suppressing signal is
8 received; and

9 a management system for comparatively evaluating load states of each access
10 point by receiving the load state information from the access points, and for transmitting
11 a load increase suppressing signal to access points whose load values are more than a
12 threshold value, when there are access points whose load values are more than the
13 threshold value and other access points around the access points whose load values are
14 more than the threshold value are in an idle state.

1 2. (Currently Amended) The apparatus of claim 1, wherein the load state
2 information transmitted to the management system from the wireless local area network
3 access points includes [[the]] a number of accessed wireless local area network terminals,
4 [[the]] a number of wireless local area network terminals recently generating data traffic,
5 [[the]] a number of data frames, and a data frame length.

1 3. (Original) The apparatus of claim 1, wherein the load increase suppressing
2 operation, performed by the wireless local area network access points, transmits an
3 authentication failure message according to an authentication request of the wireless
4 local area network terminals attempting the access.

1 4. (Original) The apparatus of claim 1, wherein the load increase suppressing
2 operation, performed by the wireless local area network access points, deletes network
3 node addresses of the wireless local area network terminals by basic service set tables and
4 intercepts the access of the wireless local area network terminals, when the wireless local
5 area network terminals, which do not continuously generate data traffic and keep
6 accessing, generate the data traffic.

1 5. (Currently Amended) The apparatus of claim 1, wherein when transmitting
2 [[the]] an authentication failure message according to [[the]] an authentication request of
3 the wireless local area network terminals, the management system transmits information
4 on other neighboring access points in the idle state to the access points whose load value
5 exceed the threshold value, the access points transmit the information on the other
6 neighboring access points in the idle state to the wireless local area network terminals,
7 and the wireless local area network terminals receive the information on the other
8 neighboring access points in the idle state from the access points and attempt access to
9 the other access points in the idle state.

1 6. (Original) The apparatus of claim 3, wherein when transmitting the
2 authentication failure message according to the authentication request of the wireless
3 local area network terminals, the management system transmits information on other
4 neighboring access points in idle state to the access points whose load value exceed the
5 threshold value, the access points transmit the information on the other neighboring

6 access points in idle state to the wireless local area network terminals, and the wireless
7 local area network terminals receive the information on the other neighboring access
8 points in idle state from the access points and attempt access to the other access points in
9 idle state.

1 7. (Currently Amended) The apparatus of claim 1, wherein when transmitting
2 [[the]]an authentication failure message according to [[the]]an authentication request of
3 the wireless local area network terminals, the management system transmits information
4 on the access-attempting wireless local area network terminals to [[the]] other idle access
5 points, and the idle access points attempt access to the wireless local area network
6 terminals.

1 8. (Original) The apparatus of claim 3, wherein when transmitting the
2 authentication failure message according to the authentication request of the wireless
3 local area network terminals, the management system transmits information on the
4 access-attempting wireless local area network terminals to the other idle access points,
5 and the idle access points attempt access to the wireless local area network terminals.

1 9. (Currently Amended) The apparatus of claim 1, wherein the management
2 system intercepts access of the wireless local area terminals by deleting network node
3 addresses of the wireless local network terminals, and wherein, when intercepting the
4 access of the wireless local area network terminals by deleting the network node
5 addresses of the wireless local area network terminals, the management system transmits
6 [[the]] information on other neighboring access points in the idle state to the access
7 points whose load values exceed the threshold value, the access points transmit the
8 information on the other neighboring access points in the idle state to the wireless local
9 area network terminals, and the wireless local area network terminals receive the

10 information on [[the]] other idle access points from the access points and attempt access
11 to the other idle access points.

1 10. (Currently Amended) The apparatus of claim 4, wherein when intercepting
2 the access of the wireless local area network terminals by deleting the network node
3 addresses of the wireless local area network terminals, the management system transmits
4 the information on other neighboring access points in the idle state to the access points
5 whose load values exceed the threshold value, the access points transmit the information
6 on the other neighboring access points in the idle state to the wireless local area network
7 terminals, and the wireless local area network terminals receive the information on the
8 other idle access points from the access points and attempt access to the other idle access
9 points.

1 11. (Currently Amended) The apparatus of claim 1, wherein the management
2 system intercepts access of the wireless local area terminals by deleting network node
3 addresses of the wireless local network terminals, and wherein, when intercepting the
4 access of the wireless local area network terminals by deleting the network node
5 addresses of the wireless local area network terminals, the management system transmits
6 [[the]] information on [[the]] access-attempting wireless local area network terminals to
7 [[the]] other idle access points, and the idle access points attempt access to the wireless
8 local area network terminals.

1 12. (Currently Amended) The apparatus of claim 4, wherein when intercepting
2 the access of the wireless local area network terminals by deleting the network node
3 addresses of the wireless local area network terminals, the management system transmits
4 [[the]] information on [[the]] access-attempting wireless local area network terminals to
5 [[the]] other idle access points, and the idle access points attempt access to the wireless

6 local area network terminals.

1 13. (Currently Amended) A method of controlling load balance of multi-access
2 points in a wireless local area network system including a plurality of wireless local area
3 network terminals and a plurality of access points, the method comprising the steps of:

4 periodically monitoring load states of the access points;

5 transmitting a load increase suppressing signal to access points whose load values
6 exceed a threshold value, when there are the access points whose load values exceed the
7 threshold value and there are idle access points around the access points while monitoring
8 the load states of the access points; and

9 suppressing an increase of load in [[the]] corresponding access points according to
10 the transmitted load increase suppressing signal.

1 14. (Currently Amended) The method of claim 13, wherein load state
2 information includes [[the]] a number of accessed wireless local area network terminals,
3 [[the]] a number of wireless local area network terminals recently generating data traffic,
4 [[the]] a number of data frames, and a data frame length.

1 15. (Currently Amended) The method of claim 13, wherein the step of
2 periodically monitoring the load states of the access points comprises the sub-steps of:

3 periodically receiving [[the]] load state information from the access points;

4 detecting timed changing values of load values by using the load state information
5 periodically received from the access points;

6 transmitting a signal for requesting to transmit the load state information to access
7 points whose timed changing values are more than a predetermined value, when the timed
8 changing values of [[the]] detected load values are more than the predetermined value;

9 generating load state information messages, including the load state information,

10 by the access points receiving the signal for requesting to transmit the load state
11 information; and

12 monitoring load states of the access points according to the load state information
13 messages generated from the access points.

1 16. (Currently Amended) The method of claim 13, wherein the step of
2 transmitting the load increase suppressing signal comprises the sub-steps of:

3 (a) determining ~~deciding~~ whether there are access points whose load values exceed
4 the threshold value based on [[the]] load state information received from [[the]]
5 multi-access points;

6 (b) repeating [[from]] the step of periodically monitoring the load states of the
7 access points when it is determined, in sub-step (a), that there are no access points whose
8 load values exceed the threshold value after deciding;

9 (c) determining ~~deciding~~ whether there are neighboring idle access points when it
10 is determined, in sub-step (a), that there are access points whose load values exceed the
11 threshold value after deciding;

12 (d) repeating [[from]] the step of periodically monitoring the load states of the
13 access points when it is determined, in sub-step (c), that there are no neighboring idle
14 access points after deciding; and

15 (e) transmitting the load increase suppressing signal to the access points whose
16 load values exceed the threshold value when it is determined, in sub-step (c), that there
17 are neighboring idle access points after deciding.

1 17. (Currently Amended) The method of claim 13, wherein the step of
2 suppressing the increase of the load in the corresponding access points comprises the
3 sub-step of transmitting an authentication response failure message for access-attempting
4 wireless local area network terminals according to [[the]] a control signal for suppressing

5 the increase of the load.

1 18. (Currently Amended) The method of claim 13, wherein the step of
2 suppressing the increase of the load in the corresponding access points comprises the
3 ~~sub-step~~ sub-steps of deleting ~~[[the]]~~ network node addresses of the wireless local area
4 network terminals from basic service set tables, and intercepting access of the wireless
5 local area network terminals, when the wireless local area network terminals, which do
6 not continuously generate data traffic and keep accessing according to ~~[[the]]~~ a control
7 signal for suppressing the increase of the load, generate ~~[[the]]~~ data traffic.

1 19. (Currently Amended) The method of claim 17, wherein the ~~[[step]]~~ sub-step
2 of transmitting the authentication response failure message for the access-attempting
3 wireless local area network terminals comprises the sub-steps of:

4 transmitting information on the neighboring idle access points to the access points
5 whose load values exceed the threshold value;

6 transmitting the information on ~~[[the]]~~ neighboring idle access points to the
7 wireless local area network terminals by the access points; and

8 attempting access to the neighboring idle access points, and setting the access by
9 the wireless local area network terminals.

1 20. (Currently Amended) The method of claim 17, wherein the ~~[[step]]~~ sub-step
2 of transmitting the authentication response failure message for the access-attempting
3 wireless local area network terminals comprises the sub-steps of:

4 transmitting information on the access-attempting wireless local area network
5 terminals to ~~[[the]]~~ neighboring idle access points; and

6 attempting access to the wireless local area network terminals, and setting the
7 access by the neighboring idle access points.

1 21. (Currently Amended) The method of claim 18, wherein the [[step]] sub-step
2 of intercepting the access of the wireless local area network terminals comprises the
3 sub-steps of:

4 transmitting [[the]] information on [[the]] neighboring idle access points to the
5 access points whose load values exceed the threshold value;

6 transmitting the information on the neighboring idle access points to the wireless
7 local area network terminals by the access points; and

8 attempting access to the neighboring idle access points, and setting the access by
9 the wireless local area network terminals.

1 22. (Currently Amended) The method of claim 18, wherein the [[step]] sub-step
2 of intercepting the access of the wireless local area network terminals comprises the
3 sub-steps of:

4 transmitting information on the wireless local area network terminals generating
5 the data traffic to the idle access points around the access points whose load values
6 exceed the threshold value; and

7 attempting access to the wireless local area network terminals, and setting the
8 access by the idle access points.

1 23. (Currently Amended) An apparatus, comprising:

2 a plurality of wireless network terminals having wireless network interfaces and
3 receiving a wireless network service;

4 a plurality of access points for providing the wireless network service to the
5 wireless network terminals, for periodically transmitting load state information, and for
6 suppressing an increase of load when a load suppressing signal is received; and

7 ~~a first~~ an evaluation unit for comparatively evaluating load states of each access

8 point by receiving the load state information from the access points, and for transmitting
9 a load increase suppressing signal to access points whose load values are more than a
10 threshold value, when there are access points whose load values are more than the
11 threshold value, and when other access points around the access points whose load values
12 are more than the threshold value are in an idle state.

1 24. (Currently Amended) The apparatus of claim 23, wherein the load state
2 information ~~transmitted to~~ received by the ~~[[first]]~~evaluation unit from the ~~wireless~~
3 ~~network~~ access points includes ~~[[the]]~~ a number of accessed wireless network terminals,
4 ~~[[the]]~~ a number of wireless network terminals recently generating data traffic, ~~[[the]]~~ a
5 number of data frames, and a data frame length.

1 25. (Currently Amended) The apparatus of claim 24, wherein ~~[[the]]~~ a load
2 increase suppressing operation, performed by the wireless network access points,
3 ~~transmits~~ includes transmitting an authentication failure message according to an
4 authentication request of ~~[[the]]~~ wireless network terminals attempting the access.

1 26. (Currently Amended) The apparatus of claim 25, wherein the load increase
2 suppressing operation, performed by the wireless network access points, ~~deletes~~ includes
3 deleting network node addresses of the wireless network terminals by basic service set
4 tables and ~~intercepts~~ intercepting the access of the wireless network terminals, when
5 ~~[[the]]~~ wireless network terminals~~[[,]]~~ which do not continuously generate data traffic
6 and which keep accessing~~[[,]]~~ generate the data traffic.

1 27. (Currently Amended) A computer-readable medium having computer-
2 executable instructions for performing a method of controlling a load balance of
3 multi-access points in a wireless local area network system including a plurality of

wireless local area network terminals and a plurality of access points, the method comprising the steps of:

periodically monitoring load states of the access points;

transmitting a load increase suppressing signal to access points whose load values exceed a threshold value, when there are the access points whose load values exceed the threshold value and there are idle access points around the access points while monitoring the load states of the access points; and

suppressing an increase of load in ~~[[the]]~~ corresponding access points according to the transmitted load increase suppressing signal.

28. (Currently Amended) The computer-readable medium having computer-executable instructions for performing the method of claim 27, wherein load state information includes ~~[[the]]~~ a number of accessed wireless local area network terminals, ~~[[the]]~~ a number of wireless local area network terminals at a certain time generating data traffic, ~~[[the]]~~ a number of data frames, and a data frame length.

29. (Currently Amended) A computer-readable medium having stored thereon a data structure, comprising:

a first field containing data representing periodically monitoring load states of ~~[[the]]~~ access points;

a second field containing data representing transmitting a load increase suppressing signal to access points whose load values exceed a threshold value, when there are the access points whose load values exceed the threshold value and there are idle access points around the access points while monitoring the load states of the access points, ~~[[with]]~~ wherein the second field of transmitting the load increase suppressing signal ~~comprising the sub-fields of~~ comprises a first sub-field containing data representing deciding whether there are access points whose load values exceed the

12 threshold value based on the load state information received from the multi-access
13 points~~[[;]]~~, a second sub-field containing data representing repeating from the first field
14 of periodically monitoring load states of the access points when there are no access points
15 whose load values exceed the threshold value ~~after deciding~~, a third sub-field containing
16 data representing deciding whether there are neighboring idle access points when there
17 are access points whose load values exceed the threshold value ~~after deciding~~, and a
18 fourth sub-field containing data representing repeating from the first field of periodically
19 monitoring load states of the access points when there are no neighboring idle access
20 points ~~after deciding~~; ~~[[and]]~~

21 a third field containing data representing transmitting the load increase
22 suppressing signal to the access points whose load values exceed the threshold value
23 when there are neighboring idle access points ~~after deciding~~; and

24 a fourth field containing data representing suppressing an increase of load in
25 ~~[[the]]~~ corresponding access points according to the transmitted load increase
26 suppressing signal.